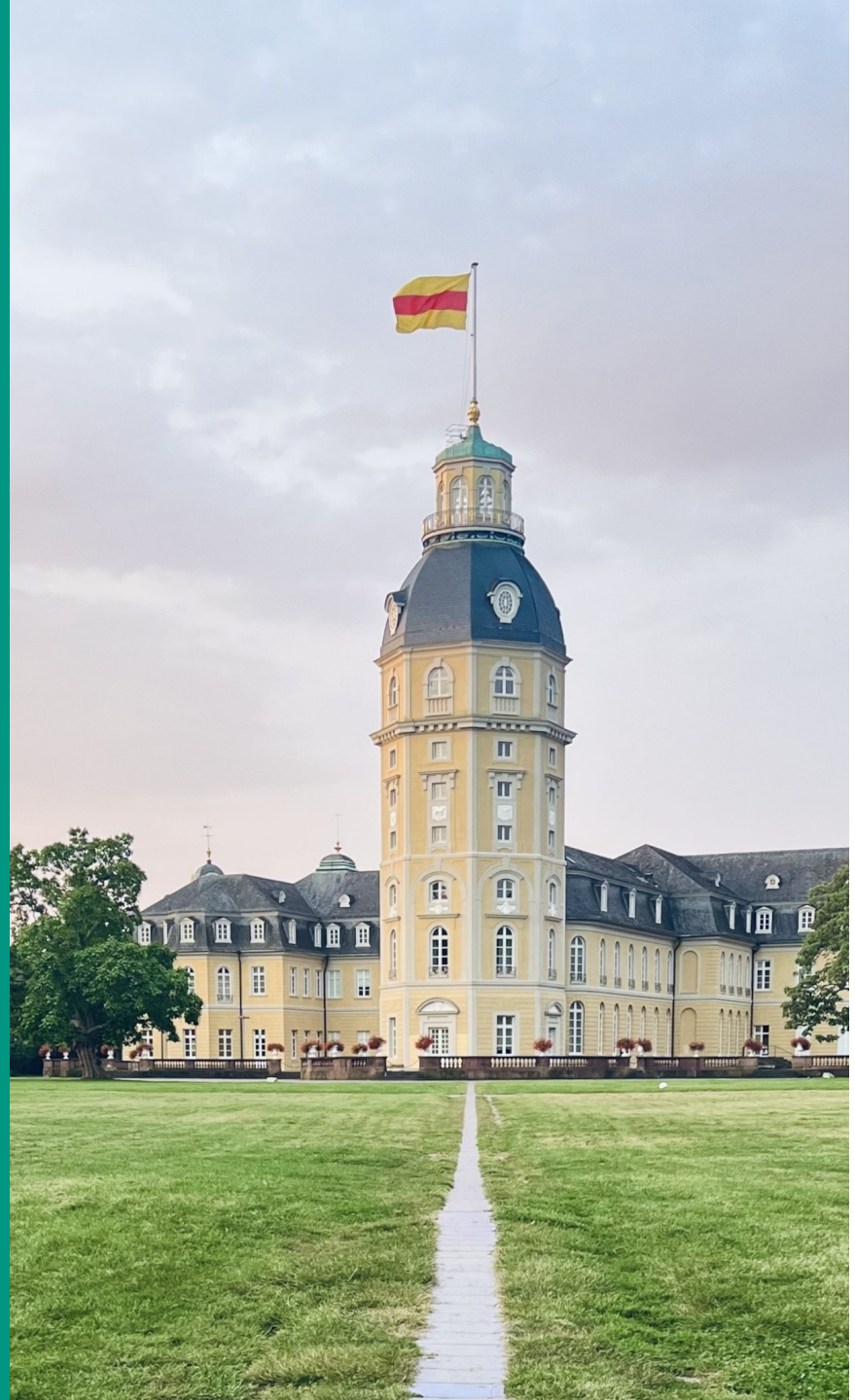
Title: Presentation with *CEL* template

Subtitle: An Introduction to CELbeamer.cls



Jone Doe, Hedongliang Liu and Laurent Schmalen

November 26, 2025

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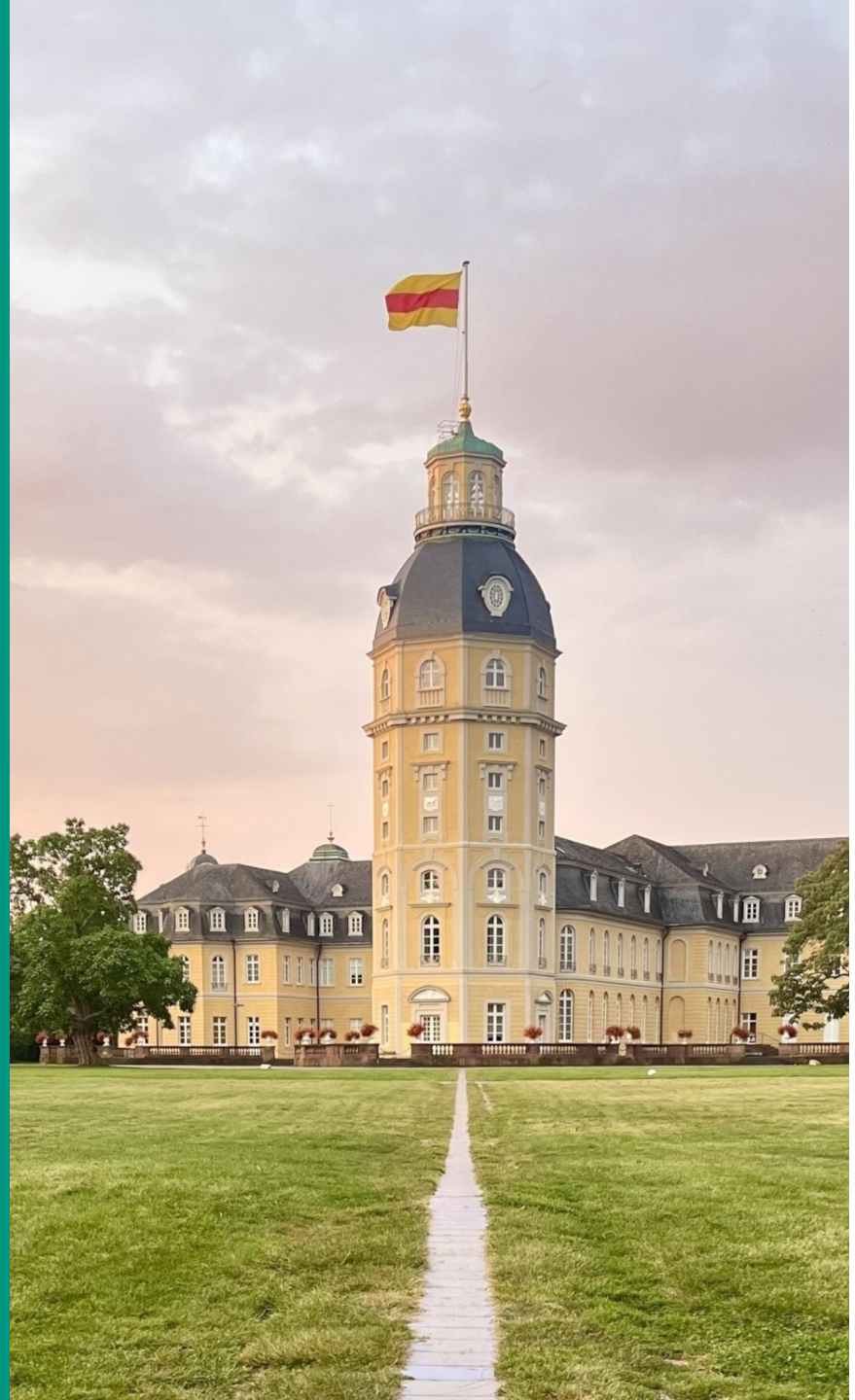

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Overview

- **Basic Usage**
  - Options
  - Color Boxes
- **Frames**
  - Title and Footer
  - Grid Page for Hand-written Notes
  - Footnotes
- **Other Tips**
  - Citations
  - Handout Mode
  - Macros

Usages Options

The following options can be used by putting the `<option>` in the `\documentclass[<option>]{CELbeamer.cls}` command:

- `en` *(default)* for English, `de` for German
- `helvet` *(default)* for Helvetica font, `franklin` for Franklin Gothic font
- `bigfoot` *(default)* sets the footer font size as 12pt; `smallfoot` sets the footer font size as 11pt.
- `navbaron` to show the navigation bar
- `kitgrid` to show the grid of rows and columns

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- `navbaron` to show the navigation bar
- `kitgrid` to show the grid of rows and columns
- `handout` to create a handout version of the slides
- `spaceforface` to leave space for face in recording
- `overviewatsection` to show the table of contents at each section
- `showsubsectionsatfirstoverview` to show all subsections at the first overview

Font Size Examples

Tiny text
Scriptsize text
Footnotesize text
Small text
Normal text
large text
Large text
LARGE text
huge text
Huge text

Color Blocks

in the KIT Color Scheme

Greenblock

Standard (`block`)

Royalblueblock

= `exampleblock`

Redblock

= `alertblock`

Grayblock

Text

Lightgrayblock

Text

Blueblock

Text

Brownblock

Text

Purpleblock

Text

Cyanblock

Text

Yellowblock

Text

Lightgreenblock

Text

Orangeblock

Text

Contentblock

This is a content block without color.

Color Boxes

with Filled Background

Standard box

Highlight box

Gray highlight box

Light gray highlight box

Slide Layout via Column Split

The pre-defined lengths `\kitcolumn`, `\kittwocolumns`, ..., `\kitsixcolumns` can be used to create columns of different widths.

This is a three-column layout.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.

This is another three-column layout.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.

Two column box

Two column box

Two column box

Overview

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- **Other Tips**

Title

Subtitle

With frames with the option `[t]`, the content is not vertically centered but started at the top edge.

With frames without a title, the free space for title can be used for content.

With frames with the option `[plain]`, neither header nor footer are displayed.

Notes Page with Grid Lines

The command `\pagesNotes{<label>}{<subtitle of the note page>}` can be used to create a page with grid lines for notes, shown on the next slide.
`\refnotes<label>` creates a symbol linked to the page with notes.
Let's learn more about entropy!
Let's learn more about divergence!

Notes

Entropy

Notes

Divengence

Footnotes

- This is a normal footnote[1].
- `\nomarkfootnote` creates a footnote without a mark in the text.
- This is another normal footnote[2].

[1] This is a normal footnote.
This is a footnote without a mark.
[2] This is another normal footnote.

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Citations in Footnote using BibLaTeX

Citations in beamer were often dealed bypasting the full text.
The biblatex package enables citing from your .bib file.
Here are several examples of usage:

- Cite full text in footnote[3] by `\footfullcite`.
- If the mark is not wanted, combine `\nomarkfootnote` and `\fullcite`.
- Cite author and year in text Rode, Geiger, Chimmalgi, and Schmalen, 2023.
- Cite title in text "End-to-end deep learning of optical fiber communications."
- Use `\supercite` to cite the alphabetic bibkey [LHGW18; KCT+18].

For more usage please refer to Biblatex Cheat Sheet.

[3] A. Rode, W. A. Gebrehiwot, S. Chimmalgi, and L. Schmalen, "Optimized geometric constellation shaping for Wiener phase noise channels with Viterbi-Viterbi carrier phase estimation," in *Proc. Eur. Conf. Opt. Commun. (ECOC)*, Glasgow, UK, Oct. 2023.
A. Rode, B. Geiger, S. Chimmalgi, and L. Schmalen, "End-to-end optimization of constellation shaping for Wiener phase noise channels with a differentiable blind phase search,", vol. 41, no. 12, pp. 3849–3859, Jun. 2023

Cite in *CEL* Style

Cite the in text by `\citereference{<bibkey>}`. E.g.,

- End-to-end learning applied to optimize multidimensional constellations for IM/DD links [KCT+18]
- End-to-end learning of transceivers for the nonlinear Fourier transform [GJDZ20]
- Constellation optimization for the zero-dispersion channel [LHGW18]

Then add the references at the bottom of the page by `\addreference{<bibid>}` for single reference, or `\addreferences{<bibid><bibid>...<bibid>\stoppreferences}` for multiple references.

[KCT+18] B. Karanov *et al.*, "End-to-end deep learning of optical fiber communications,", vol. 36, no. 20, pp. 4843–4855, 2018

[GJDZ20] S. Gaiarin, R. Jones, F. Da Ros, and D. Zibar, "End-to-end optimized nonlinear fourier transform-based coherent communications," in *2020 Conference on Lasers and Electro-Optics (CLEO)*, IEEE, 2020, pp. 1–2

[LHGW18] S. Li, C. Häger, N. Garcia, and H. Wymeersch, "Achievable information rates for nonlinear fiber communication via end-to-end autoencoder learning," in *2018 European Conference on Optical Communication (ECOC)*, IEEE, 2018, pp. 1–3

Handout Mode

Handout mode is activated by the option `handout` in the document class.
A frame with multiple animated slides will be shown on one slide in the handout version.
One can still control the number of slides of one frame in the handout version, e.g.,

- One: This will not be shown in the handout version.
- Two: This will not be shown in the handout version.

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- Two: This is also shown on the first slide in the handout version.
- Three: This is shown on the second slide in the handout version.

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- One: This is shown on the first slide of this frame in the handout version.
- Two: This is also shown on the first slide in the handout version.
- Four: This is also shown on the second slide in the handout version.

Predefined Macros

- **Schlagwort** for highlighting keywords
- An important thing ☜ for pointing out important things

Math macros

- `\coloneq` $:=$ for defining a new variable, e.g., $a := b + c$
- `\myspan{·}` for span notation, e.g. $\langle \boldsymbol{a}, \boldsymbol{b}, \boldsymbol{c} \rangle$
- `\ceil{·}` $\lceil x \rceil$ for ceiling function, e.g., $\lceil 3.14 \rceil = 4$
- `\floor{·}` $\lfloor x \rfloor$ for floor function, e.g., $\lfloor 3.14 \rfloor = 3$
- `\dd` for differential operator, e.g., $\int f(x)\,\mathrm{d}x$, $\frac{\mathrm{d}f(x)}{\mathrm{d}x}$
- `\real` Re for real part, e.g., $\mathrm{Re}(z)$
- `\imag` Im for imaginary part, e.g., $\mathrm{Im}(z)$

Math Macros (Cont'd)

- `\sinc` $\operatorname{sinc}(x)$ for sinc function, e.g., $\operatorname{sinc}(x) = \frac{\sin(\pi x)}{\pi x}$
- `\rect` $\operatorname{rect}(x)$ for rectangular function, e.g., $\operatorname{rect}(x) = \begin{cases} 1 & |x| \leq \frac{1}{2} \\ 0 & \text{otherwise} \end{cases}$

Math symbols:

- `\cA,` $\cdots$ $\mathcal{A}, \mathcal{B}, \mathcal{C}, \cdots$ for calligraphic letters
- $\mathbf{0}, \boldsymbol{n}, \boldsymbol{\alpha}, \boldsymbol{M}, \boldsymbol{\mathcal{M}}$ for bold math symbols
- $\mathbb{N}, \mathbb{R}, \mathbb{Z}$ blackboard bold symbols for the sets of natural numbers, real numbers, and integers, respectively
- $\mathbb{F}, \mathbb{F}_q, \mathbb{F}_{q^m}$ for finite field
- $\mathsf{A}, \mathsf{B}, \mathsf{C}, \cdots$ sans-serif math letters, usually for naming instead of parameters in notations

Backup Parts

Backup Parts

Slides that are inserted after `\beginbackup` do not count towards the total number of slides.

KIT Color Palette